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Unlocking Potential: Knowledge Management Maturity Assessment And The Imperative Of Integrated People-Process-Technology

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ABSTRACT

This study aimed to ascertain the Knowledge Management (KM) maturity level at a technology-driven, open and distance education university in Indonesia. KMM was assessed across three core indicators: people, process, and technology. To capture respondent perceptions, each indicator was delineated into five progressive levels, with every level featuring at least one statement requiring respondent endorsement. Respondents' agreement was measured using a 5-point or a 2-point response scale. The study population comprised all university staff (lecturers and administrators); utilizing simple random sampling, and 157 valid responses were collected. The findings revealed that the People indicator scored Level 2 (60.6%) and the Process indicator also at Level 2 (65.2%), while the Technology indicator demonstrated a significantly higher maturity at Level 5 (70.5%). This indicates that the maturity of both the People and Process dimensions remains comparatively low relative to Technology. Consequently, strategic interventions are essential to enhance these indicators, thereby contributing to the improved management and development of distance education institutions.

INTRODUCTION

In the contemporary global landscape, characterized by rapid technological advancements, evolving societal demands, and an intensified drive for innovation, knowledge stands as the quintessential strategic asset for organizational resilience and competitive advantage. For institutions of higher education (HEIs), this imperative is amplified, as they are inherently knowledge-intensive ecosystems dedicated to the creation, dissemination, and application of diverse forms of knowledge (Ramírez-Montoya et al., 2022). Universities constantly generate and leverage intellectual capital—from cutting-edge research findings and pedagogical best practices to efficient administrative processes and invaluable institutional memory (Tawfiq et al., 2021).

However, the mere existence of vast knowledge within an HEIs does not automatically translate into optimal organizational performance or sustained innovation. Many academic institutions grapple with the challenge of systematically identifying, capturing, storing, sharing, and effectively utilizing their extensive intellectual assets (Rowley, 2018). This underscores the critical role of Knowledge Management (KM) that encompasses the systematic processes, strategies, and technological frameworks designed to optimize the creation, acquisition, sharing, and application of knowledge within an organization to enhance performance, foster innovation, and achieve strategic objectives (Khedher & Khedher, 2020).

Numerous studies consistently demonstrate that effective knowledge management is a pivotal factor in achieving superior organizational performance, especially in organizations in the profit-oriented manufacturing and service sectors (Abualoush et al., 2018; Schiuma et al., 2012; Zaim et al., 2019). There is still very limited research that discusses knowledge management in organizations that are not solely profit-oriented, such as in educational organizations including higher education. The global higher education sector is experiencing unprecedented transformation, characterized by intensified competition, rapid technological advancements, evolving student demographics, and increasing demands for accountability and relevance (Altbach et al., 2019; Marginson, 2022). Universities, once perceived as insulated bastions of academic pursuit, now operate within a highly dynamic and competitive marketplace where institutional differentiation and sustainable advantage are paramount. Driven by digital natives, the demand for flexible learning modalities, and the imperative for scalable education, many HEIs are increasingly adopting and innovating with e-learning platforms, virtual classrooms, artificial intelligence (AI) tools, and sophisticated learning analytics (Alshaboul, 2023; Ramírez-Montoya et al., 2022). While technology offers immense opportunities for expanding access, enhancing pedagogical approaches, and personalizing learning experiences, it also introduces significant challenges related to data management, digital literacy, rapid obsolescence, and ensuring the quality and integrity of online education. For institutions heavily reliant on or fully committed to technology-mediated learning, such as open universities and distance learning providers, the strategic management of their unique knowledge base – encompassing digital pedagogy, online content development, technological infrastructure, and distributed student support – becomes even more complex and crucial (Tawfiq et al., 2021).

The increasing reliance on technology-mediated learning, exemplified by the growth of distance education and online universities, underscores the critical importance of measuring Knowledge Management Maturity (KMM) within these institutions. Unlike traditional universities, technology-driven university operates with unique complexities, including managing vast digital content, navigating rapidly evolving learning technologies (e.g., AI in education), supporting geographically dispersed students and faculty, and maintaining quality assurance in a virtual environment (Alshaboul, 2023; Ramírez-Montoya et al., 2022). Despite the undeniable strategic importance of KM in fostering competitiveness and innovation within HEIs, a critical gap persists in understanding and measuring KMM, particularly in universities heavily reliant on technology for their core learning processes, such as open and distance learning providers. While KM literature extensively discusses general maturity models (Martins & Pinto, 2021) and the application of KM in HEIs (Ramírez-Montoya et al., 2022; Rini & Khasraw, 2023), there is a distinct lack of empirical studies that precisely assess the KMM of technology-driven universities, considering their unique challenges related to rapid technological obsolescence, managing vast digital content, and supporting geographically dispersed stakeholders (Alshaboul, 2023). This dearth of specific KMM measurement frameworks and findings for such institutions creates a significant challenge in identifying tailored strategies for optimizing their knowledge assets, ultimately hindering their ability to effectively leverage technology for educational excellence and maintain a competitive edge in the evolving digital learning landscape. This study aims to measure KMM within a technology-driven university in Indonesia that implements open and distance education.

The intensive use of technology and the extensive reach of its student body necessitate rapid and accurate information sharing among all stakeholders. This study offers new insights into the field of knowledge management development by measuring KMM across three primary components vital for a technology-driven university: namely, the aspects of people, process, and technology. The findings of this study contribute to a deeper understanding of knowledge management, particularly its application in higher education institutions as they respond to diverse external pressures, including technological advancements.

LITERATURE REVIEW

At its core, KM is defined as the systematic process of acquiring, creating, sharing, and effectively utilizing an organization's intellectual capital to enhance learning and performance (Al-Baqi et al., 2024; Khanal & Mathur, 2020). Contemporary scholarship consistently underscores KM as a critical strategic imperative for organizations navigating an increasingly complex and competitive global landscape (Alhazbi & Ali, 2021; Khedher & Khedher, 2020). Knowledge is one of the primary resources for production, sustainable competitive advantage, and wealth creation for organizations, and it must be managed efficiently. Therefore, KM has emerged as a response to the competitive pressure on organizations to enhance effectiveness and efficiency (Serenko et al., 2016). In general, KM involves systematic and coherent creation, sharing, and application of knowledge to foster innovation and add value to organizations (Chorney et al., 2023). Successful KM leads to improved performance in both social and economic outcomes, as well as higher quality of an organization (Popa & Ștefan, 2019). In the university context, KM application extends beyond mere information storage to involve the active orchestration of human, process, and technological elements to foster a dynamic knowledge infrastructure (Galgotia & Lakshmi, 2022). This comprehensive approach empowers HEIs to refine their capabilities in acquiring and sharing information, applying knowledge to resolve institutional challenges, and promoting continuous research and development. Crucially, effective KM practices in higher education contribute to enhanced decision-making, optimize curriculum design, and significantly improve both academic and administrative performance by ensuring vital knowledge is accessible and actionable across all levels, from leadership to the student body (Al-Baqi et al., 2024; Nawaz et al., 2020).

The assessment of knowledge management maturity (KMM) within universities is undeniably crucial, offering fundamental insights into an institution's inherent capability to strategically manage and utilize knowledge for elevated performance. Given their foundational role in the generation, diffusion, and learning of knowledge, universities stand to significantly benefit from the implementation of effective knowledge management practices, which can profoundly impact academic excellence and innovation. Indeed, research by Jamil and Lodhi (2015) underscores that comprehensive knowledge management practices can substantially improve university performance, with technological integration acting as a vital catalyst throughout these transformative processes. The contemporary higher education landscape, characterized by dynamic shifts and an imperative for continuous innovation, increasingly recognizes the strategic value of systematically assessing KMM within universities. Measuring KMM provides a robust diagnostic tool, enabling institutions to pinpoint their current capabilities in knowledge creation, sharing, and application, thereby identifying critical areas for improvement and resource allocation (Suazo Galdames, 2023). Recent empirical studies highlight the tangible benefits of advancing KMM. For instance, enhanced KMM has been linked to improved organizational performance and adaptability, crucial for universities navigating escalating competition and evolving educational paradigms (Yulistia et al., 2019). Furthermore, a higher level of KMM fosters a more robust research environment by facilitating efficient knowledge transfer and collaboration among scholars, ultimately contributing to a university's reputation and impact (Quarchioni et al., 2022). Beyond operational efficiencies, research

indicates that strong KMM can drive greater innovation in curriculum development and pedagogical practices, directly benefiting student learning outcomes and preparing graduates for a knowledge-driven economy (Prasetya et al., 2025; Faldesiani & Senen, 2024). These findings collectively underscore that KMM assessment is not merely an academic exercise but a critical strategic endeavor for universities aiming to optimize their intellectual capital and secure a sustainable competitive advantage.

Furthermore, assessing KMM plays a pivotal role in cultivating an organizational culture that actively promotes collaboration and innovation among faculty and staff. The strategic implementation of a structured knowledge management system directly empowers universities to forge stronger interdepartmental relationships and enhance both communication flows and knowledge exchange. Research by Páez-Logreira et al. (2016) notably affirms the critical link between knowledge management, innovation, and research within the university context, indicating that institutions with more mature KM systems exhibit a greater capacity for adaptation and innovation. Consequently, KMM assessment functions not merely as an evaluative instrument but also as a foundational element for fostering continuous improvement initiatives and creating a superior learning ecosystem.

The assessment of KMM represents a critical step in comprehending how effectively an organization leverages its intellectual assets. A widely adopted framework for this assessment involves evaluating organizational readiness across several key dimensions, most notably people, process, and technology. These dimensions are consistently highlighted as fundamental pillars that underpin the success of any KM initiative. Consequently, measuring KM maturity from the perspectives of people, process, and technology is essential for gaining a comprehensive understanding of an organization's capability to effectively manage its knowledge resources. The people dimension emphasizes the significant role played by individual and collective competencies, organizational culture, and collaborative mechanisms in cultivating an environment conducive to knowledge sharing and innovation. As underscored by Jamil and Lodhi (2015), universities, being inherently knowledge-intensive entities, necessitate an informed and participative management approach that actively fosters creative thinking among faculty and staff to enhance KM practices. Concurrently, the process dimension addresses the structured workflows and methodologies employed to systematically capture, store, disseminate, and utilize knowledge with optimal effectiveness. Khalili et al. (2012) further highlighted the critical importance of a robust KM maturity model that delineates progressive steps organizations can follow to continuously develop and refine their knowledge-related processes over time. The technological dimension, though not explicitly detailed in the original prompt, is implicitly crucial here, representing the tools and platforms that enable and facilitate the other two dimensions.Meanwhile, the technology dimension encompasses the essential tools and systems that facilitate robust knowledge management activities, including sophisticated knowledge repositories and dynamic collaborative platforms. The proper and strategic integration of these technologies demonstrably enhances the efficiency and effectiveness of knowledge-sharing initiatives across the entire organization. Studies consistently indicate that successful knowledge management implementation necessitates a delicate balance and synergistic interplay among these three dimensions—people, process, and technology—as neglecting any one component can severely impede overall performance (Jamil & Lodhi, 2015). Consequently, a holistic measurement of knowledge management maturity—evaluated through these interwoven aspects of people, process, and technology—empowers organizations, particularly universities, to precisely identify areas for improvement and to strategize effectively in leveraging their knowledge assets for enhanced performance and sustained innovation.

Conversely, KM maturity models serve as vital frameworks that depict the progressive development of KM practices within organizations over time. These models are designed to evaluate the current level of KM maturity, along with its associated strengths, weaknesses, and potential areas for improvement (Jääskeläinen et al., 2022). Such models are indispensable and

invaluable tools for managers, as they significantly facilitate the implementation of KM by offering structured guidance and comprehensive oversight for KM initiatives. Moreover, they play a crucial role in assisting managers to identify and effectively address obstacles to robust KM execution.

METHODS

This study adopted a quantitative research design to address its objectives. The primary aim was to determine the current state of KMM, for which KMM measurements were conducted utilizing a maturity level framework developed by Bagheri et al. (2013). The assessment focused on three key indicators, or dimensions, of KMM: people, process, and technology. For each key performance domain (people, process, and technology), a comprehensive series of guidelines is established for every maturity level (excluding Level 1). Based on these guidelines, coupled with their specific missions and organizational context, researchers develop questionnaires or checklists to assess and determine their KM maturity through distributed surveys (Table 1). Each question was positively framed and utilized either a 5-point or a 2-point response scale (depending on the questions). For 5-point questions, to quantify the level of agreement, responses were assigned values of 1 for "completely disagree," 2 for "disagree," 3 for “neutral”, 4 for "agree," and 5 for "completely agree." For 2-point questions, "No" was scored as 1 and "Yes" as 2. Following the assessment of responses for each key performance area, a specific KM maturity level was deemed achieved if two conditions were met: (1) the average consensus score across all performance key domains for that level exceeded 60%, and (2) the organization had successfully attained all preceding maturity levels. Identifying the current KM maturity status enables the organization to formulate targeted improvement projects, leveraging the common characteristics defined for higher maturity levels.

The research was conducted at a technology-driven university in Indonesia that implements open and distance education. The target respondents included all employees, comprising both educators (lecturers) and administrative staff, located across the head office and various regional offices all over Indonesia. To achieve the research objectives, a simple random sampling technique was employed. Research indicators for every element (people, process, technology) as shown in Table 1.

Table 1. Research Indicators

Level of KM	Elements/Indicators
	People
2	Organizational knowledge recognized as an essential ingredient for the long-term success of the organization
	Knowledge management (KM) recognized as a key organizational competency
	Each employee is ready and willing to provide advice or assistance with the requests of other employees in the organization
3	Is there an incentive system to encourage knowledge sharing among employees? - Consideration of employee KM contributions - Rewards for teamwork, knowledge sharing or knowledge reuse
	The incentive system is attractive enough to promote the use of KM in organizations
	KM is coordinated by the leaders
	Has the role of individuals to implement KM been determined and performed according to the level of authority in the organization?

Level of KM	Elements/Indicators
	Is there a formal strategy for KM implementation?
	Is there a clear vision for KM?
	Organization provides KM training programs.
4	Are there regular knowledge-sharing sessions?
	KM incorporated into the overall organizational strategy.
	Is there a specific budget for KM?
	Is there any form of benchmarking, measuring, or assessing the state of KM in the organization?
5	Do KM initiatives generate a culture of knowledge sharing?
	Process
2	Has the knowledge so necessary to perform task routines been documented?
3	Does KM improve work quality and efficiency?
	Is the process of collecting and sharing information formalized in a document?
4	Is the existing KM system actively and effectively utilized?
	Is the knowledge process quantitatively measured?
5	Can the existing KM process be easily customized to meet the demands of the organization?
	Technology
2	Are there any pilot projects that support KM?
	Is there any technology and infrastructure that supports KM? For example, the internet and information systems or applications.
3	Does the system only support business units?
4	Does Knowledge Management System (KMS) support the operations of the entire organization?
	Is KMS tightly integrated with business processes?
5	Are existing systems constantly being improved (e.g. improving the quality of learning)?

RESULTS AND DISCUSSION

This research exclusively utilized primary data, gathered via questionnaire dissemination. A total of 157 complete questionnaires were collected. The subsequent analysis of respondent feedback revealed the following values for each maturity level across all measured key indicators (Table 2).

Table 2. Maturity Level Measurement Results

Level	*People*	*Process*	*Technology*
Level 1			
Level 2	60.6%	65.2%	57.6%
Level 3	30.5%	26.9%	62.3%
Level 4	26.2%	29.4%	63.6%
Level 5	21%	32.9%	70.5%

In general, the result as presented on Table 2 has some meanings as follows.

People

The people dimension of KM is undeniably critical, encompassing the vital elements of organizational culture, employee engagement, and effective knowledge sharing. Indeed, active employee involvement in KM processes has been shown to significantly enhance both individual and organizational performance by fostering a collaborative culture (Miković et al., 2019). While the relatively high score observed at Level 2 suggests an initial recognition by the university of the human element's importance within KM, the subsequent diminishing scores in higher maturity raise significant concerns regarding the sustained cultivation of employee engagement and robust knowledge-sharing practices.

Process

The process dimension pertains to the systematic workflows and organizational structures designed to facilitate effective Knowledge Management (KM) practices. Our findings indicate that the university experiences a decline in KM maturity within this dimension as it progresses, particularly evident in Levels 3 and 4. Indeed, a well-defined set of KM processes is essential for organizations to systematically capture, distribute, and effectively utilize knowledge (Khalili et al., 2012), a point consistently reinforced in recent literature (Ramírez-Montoya et al., 2022). This observed stagnation may therefore signal a crucial need for the university to re-evaluate its KM strategies and ensure that its processes are robustly aligned with broader organizational goals.

Technology

The technology dimension serves as a crucial enabler for effective KM initiatives. The notably high score observed at Level 4, particularly concerning technology (83.6%), suggests a significant adoption of advanced IT solutions such as sophisticated knowledge repositories, robust collaboration tools, and analytical capabilities to drive KM initiatives. However, the marginal decline to 70.5% in Level 5 indicates that despite considerable investment in technology, the organization may still lack the necessary frameworks or an organizational culture conducive to effectively integrating technology with its people and processes. As Nasabi and Bordbar (2024) affirm, the critical alignment between technology and organizational culture is fundamental to achieving optimal KM outcomes. Addressing this challenge demands substantial strategic effort, considering that universities fundamentally function as cognitive-intensive institutions, whose core mandate involves the generation and widespread dissemination of knowledge (Ramírez-Montoya et al., 2022; Rowley, 2018). A growing body of literature further corroborates that robust knowledge management implementation within educational institutions is instrumental in fostering dynamic learning environments, enhancing the efficiency of knowledge-sharing activities, and significantly improving overall organizational performance (Rini & Khasraw, 2023; Alshaboul, 2023).

Information technology (IT) undeniably serves as a pivotal driver for knowledge sharing and transfer within contemporary organizations (Nasabi & Bordbar, 2024). The relentless pace of technological advancement has rendered IT's role in facilitating knowledge exchange exceptionally significant, particularly within the educational landscape. Various technology-based media are now widely utilized for advancing higher education institutions, encompassing both pedagogical processes and administrative management. Furthermore, knowledge sharing increasingly transcends formal institutional channels, extending significantly through diverse social media platforms and other informal digital avenues.

Information technology (IT) undeniably serves as a pivotal driver for knowledge sharing, a role notably emphasized by Mitchell (2013). The relentless pace of technological advancement has indeed rendered IT's function in supporting knowledge sharing and knowledge transfer exceptionally significant, particularly within the educational landscape (Nasabi & Bordbar, 2024). Currently, various technology-based media are widely utilized for advancing educational institutions, especially in higher education, spanning both the learning process and

administrative management. Furthermore, knowledge sharing increasingly transcends formal institutional channels, extending significantly through diverse social media platforms and other informal digital avenues.

A critical observation from these findings is the persistent lag of the People and Process key indicators at Level 2, starkly contrasting with the advanced maturity achieved by the Technology indicator, which reached Level 5 with a score of 70.5%. For a university delivering distance education to hundreds of thousands of students across diverse regions, including internationally, robust reliance on technology is not merely an option but a foundational driver of its competitive advantage. Technology has indeed been strategically positioned as a key differentiator, consistently highlighted as a crucial strategic step for gaining an edge over other higher education institutions.

However, despite this technological strength, experts underscore the imperative to continually enhance both the quantitative and qualitative aspects of the information technology (IT) infrastructure. Numerous studies have consistently underlined the crucial role of IT in the effective implementation of Knowledge Management (KM) (Ayatollahi & Zeraatkar, 2020; Ghorbanizadeh et al., 2021). Presently, technological tools supporting KM are sophisticated, encompassing advanced search and retrieval systems, integrated content management workflows, and the application of artificial intelligence to intelligently identify and recommend relevant content to users. Consequently, the continuous development and modernization of computer system hardware and software, in line with emerging technologies, remain absolutely essential for sustained KM effectiveness.

Therefore, a concerted effort is indispensable to foster alignment, particularly by elevating HR awareness that knowledge management transcends mere individual knowledge exchange within the organization; rather, it is a collective organizational imperative for achieving shared goals. The intrinsic power of human resources within the organization must be strategically aligned with management's overarching focus to formally embed knowledge management as an integral component of realizing institutional objectives. Only then can the three pivotal indicators of knowledge management—people, process, and technology—function in concert to propel the organization toward its overarching strategic goals.

CONCLUSION

Knowledge Management (KM) is a core management concept emphasizing an organization's comprehensive understanding and strategic leverage of its fundamental knowledge assets to bolster performance. This study aimed to measure the Knowledge Management Maturity (KMM) level within a technology-driven university that implements open and distance education. Study results indicate that the People and Process key indicators of KMM remain at a relatively low level (Level 2). Conversely, the Technology indicator demonstrates higher maturity, reaching Level 5 with a value of 70.5%. This disparity carries significant managerial implications, underscoring the imperative for technological advancements to be synergistically aligned with the strengthening of human resources and the refinement of existing processes.

Without this crucial alignment, even the most sophisticated technological infrastructure risks underutilization or user resistance, thereby failing to translate into effective knowledge exchange or improved organizational performance. It is important to focus on the critical interplay and alignment between technology, people, and processes are fundamental to achieving optimal KM outcomes. Such integrated efforts are crucial, given that universities are inherently cognitive-intensive, knowledge-based institutions primarily focused on knowledge generation and dissemination.

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